

adapt_2000

February 23, 2011

Abstract

This task adaptively smooths background subtracted and exposure corrected **mo-
saicked** images.

1 Instruments/Modes

Instrument	Mode
EPIC	Imaging

2 Use

pipeline processing	no
interactive analysis	yes

3 Description

adapt_2000 adaptively smooths background subtracted and exposure corrected mosaicked images. For each unmasked pixel, the program will average neighboring pixels within a circle of increasing radius until a selected number of weighted counts from the count image is reached. The original pixel is then given the weighted average surface brightness for the pixels within the circle. Binning by 2 or 4 and of different bands can also be selected.

Warning and requirements: **adapt_2000** is part of the package *esas*, integrated into SAS, but is limited to work within the *esas* data reduction scheme. This is specially true wrt structure and names of the input files. In particular, *adapt_2000* assumes that all tasks to create images from the individual observations have been run as well as the the task *merge_comp_xmm* which mosaics the different components.

4 Parameters

This section documents the parameters recognized by this task (if any).

Parameter	Mand	Type	Default	Constraints
-----------	------	------	---------	-------------



smoothingcounts	yes	int	100	
------------------------	-----	-----	-----	--

The number of counts to accumulate for the smoothing

thresholdmasking	yes	real	0.02	
-------------------------	-----	------	------	--

The scale factor for excluding regions from the smoothing based on a mask image. In the default mode the average exposure is calculated and then any pixel with exposure less than fraction*average value is excluded.

nbands	yes	int	2	
---------------	-----	-----	---	--

Number of bands to be combined

elowlist	yes	int	350 800	
-----------------	-----	-----	---------	--

Low energy for successive bands in eV

ehigh	yes	int	800 1000	
--------------	-----	-----	----------	--

High energy for successive bands in eV

binning	yes	int	1	
----------------	-----	-----	---	--

Binning control with 1 for no binning, 2 for binning by 2, and 4 for binning by 4.

withpartcontrol	yes	bool	yes	
------------------------	-----	------	-----	--

Particle background control, "yes" to subtract the model particle background image.

withsoftcontrol	yes	bool	no	
------------------------	-----	------	----	--

Soft proton background control, "yes" to subtract the soft proton background image.

withswcxcontrol	yes	bool	no	
------------------------	-----	------	----	--

Solar wind charge exchange background control, "yes" to subtract the SWCX background image.

withoffsetbkgcontrol	yes	bool	yes	
-----------------------------	-----	------	-----	--

Offset background control, "yes" to subtract the offset background image. This is a feature currently under development and is not yet functional.

withmaskcontrol	yes	bool	yes	
------------------------	-----	------	-----	--

Mask control, "yes" for using a mask image (pixel with 1 in image will be included, pixel with 0 will be excluded).

mask	yes	dataset	mask.fit	
-------------	-----	---------	----------	--

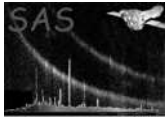
Mask image file name.

fill	yes	int	1	
-------------	-----	-----	---	--

Number of passes to fill in empty pixels. If a zero pixel has three or more non-zero neighbors, the pixel will be the average value of those neighbors.

5 Input Files

The exposure corrected mosaicked images, products from running `merge_comp_xmm`, following the particular nomenclature used in the `esas` package, eg.: *obj-im-350-800.fits* for a mosaicked image with the first band in that spectral range.



6 Output Files

- `adapt-elow-ehigh.fits` – The smoothed image for the selected energy band (*elow* and *ehigh*) of the selected region in sky coordinates.
- `radial-filt-elow-ehigh.qdp` – A QDP plot file of the radial profile of the data for the selected energy band (*elow* and *ehigh*) of the selected region.

7 Algorithm

`adapt_2000` adaptively smooths background subtracted and exposure corrected mosaicked images. For each unmasked pixel, the program will average neighboring pixels within a circle of increasing radius until a selected number of counts from the count image is reached. The original pixel is then given the average surface brightness for the pixels within the circle. Binning by 2 or 4 and of different bands can also be selected.

8 Comments

References